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ABSTRACT

A project was conducted to recommend the acquisition and installation of state-of-the-art computer laboratories, software, and teacher training that will better prepare students in Delaware for employment in information processing occupations. Four major activities were undertaken: (1) a survey of 1,426 Delaware office workers to determine the computer hardware and software being used by and skill requirements for entry-level office workers; (2) a survey of 31 comprehensive high school and area vocational schools to determine the type and number of computers in the business department and the computer applications integrated in each business course; (3) the formation of a steering/technology committee to review the survey results and any proposals; and (4) the formation of a task force of business teachers, business and industry representatives, computer specialists, and school and state administrators to discuss labor market needs in office occupations and propose information processing methodology and instructional activities. As a result of the study, recommendations were made for hardware and software purchase. Specific recommendations and budgets for these purchases were drawn up for comprehensive and vocational high schools. (Appendices include lists of hardware and software used in businesses and high schools and proposed curriculum sequences for data processing occupations.) (KC)

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IMPLICATIONS AND RECOMMENDATIONS FOR UPDATING, EXPANDING AND IMPROVING BUSINESS EDUCATION

A RESEARCH PROJECT

OCTOBER, 1988

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Office of Educational Research and Improvement
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PART I

INTRODUCTION

The purpose of this project will be to recommend the acquisition and installation of state-of-the art computer laboratories, software and teacher training that will better prepare students for employment in Information Processing Occupations.

To achieve this purpose, four major activities were undertaken:

1) A survey of Delaware businesses to determine

   - The computer hardware and software being used by entry level office workers, and

   - The pre-employment skills required of entry level office workers. (Appendix A)

2) A survey of comprehensive high school and area vocational schools to determine

   - The type and number of computers in the Business Department, and

   - The computer applications integrated in each business course. (Appendix B)

3) The formation of a Steering/Technology Committee to review the survey results and any proposals. (Appendix C)

4) The formation of a Task Force of business teachers, business and industry representatives, computer specialists, school administrators and DPI staff to discuss labor market needs in office occupations and propose information processing methodology and instructional activities. (Appendix D)

Background

The Widespread Use of Computers and Microcomputers. In the past ten years, computers have virtually invaded our businesses, our homes, and our schools. The computer is becoming as commonplace as the typewriter and the calculator. The most significant growth in the computer market has been with microcomputers. In the early 1980s, microcomputer sales increased at the rate of 60 to 100% per year (Miller, 1983) and this tremendous growth rate has continued and has implications for the schools.

For years, large business firms and governmental agencies have been using the more sophisticated computer systems, such as mainframes, mini-computers, and stand-alone word processors. But, recently many small businesses have discovered that the low cost of computers is greatly reduced and have a wide range of capabilities which present viable alternatives to current methods of operation. Larger firms in the "Fortune 500" group also discovered the increasing power and versatility of the micro (Miller, 1985). In 1984 Arthur Anderson and Company, an international accounting firm, employed 1,500 microcomputers in its practice (Dennis, 1984). As a result of this increased use of computer systems, the role of the office worker has changed dramatically. Computerized systems have automated many routine clerical functions such as word processing and record filing.

The wide range of computer usage was profiled in a study jointly conducted by the National Federation of Independent Businesses (NFIB) and the Institute for Research on Educational Finance and Governance (REFG). In October of 1985, a survey was mailed to 10,000 members of NFIB to collect a variety of information about the use of computers in the nation's small businesses. Based on a return of 2,813 usable questionnaires, forty percent had acquired computers. The proportion of firms with computers varied by the size of the firm. The larger the firm the more likely it was to have computers. Ninety-five percent of the largest firms (100 or more employees) had computers, whereas only 26 percent of the smallest firms (1 to 4 employees) had computers. The most commonly reported brands of computer equipment were IBM, Radio Shack, and Apple. The respondents indicated that the computer was used to perform a variety of office tasks, ranging from word processing to scheduling. The most common uses of the computer were for word processing and accounting. (Rumberger & Levin, 1986)

A more recent survey of software users was reported by PC Magazine in their February 29, 1988 issue. To determine the popularity of word processing programs, the magazine posted a survey consisting of six questions on the magazine's Interactive Reader Service (a computer bulletin board/information service). A total of 1,271 responses were collected and evaluated. The survey indicates that WordPerfect is presently the most widely-used word processing program in both the corporate world and at home; Twenty-seven percent of the respondents listed this program as the word processing program they currently use. This compares with a 19% share for WordStar, and 11% for Microsoft Word. The advantage that WordPerfect has gained in the field appears to have been gained largely at the expense of WordStar, which was formerly the most popular program.

Even though computers have made the most dramatic changes in the way we process information, the expense of this "high technology" equipment has made it difficult for many educational systems to purchase equipment for their training programs. This problem is compounded by such factors as less tax revenue for educational uses and the rapidly changing technology which makes it difficult to keep equipment up-to-date.

The Carl D. Perkins Vocational Education Act of 1984 made it possible, through cost sharing, for schools to purchase equipment that will upgrade and modernize their vocational programs. The proliferation of computers and software makes it difficult for school officials to become informed consumers. Currently there are over two hundred manufacturers marketing microcomputers. Computers range in price from a few hundred dollars to several thousand dollars each. In addition to the cost factor, consideration has to be given to the compatibility of equipment and software and the availability of repair and technical service (Schmidt, 1985). Teachers and administrators often need assistance in selecting computer components that will fit budgets and training needs. Local educational agencies also often lack the time, staff, and expertise to adequately survey the business community to determine which computer-related competencies vocational students must possess to be successful in seeking and/or retaining employment.

Computer Instruction in Business Education. Nowhere within the secondary school curriculum is the increased use of microcomputers more evident than in

Business Education. Virtually every course offered has implications for computer applications.

Delaware's status as a corporate headquarters for the chemical industry and the recent high growth experience in the banking industry contributes to the exceptionally high demand for office workers. The following is a list of Fast-Growth Occupations projected by the Department of Labor (Delaware Department of Labor, 1988).

Occupation	Percent of Growth
New Accounts Clerks	83.7
Loan and Credit Clerks	78.3
Peripheral EDP Equipment Operators	42.5
Data Entry Keyers	37.2
Insurance Policy Processing Clerks	34.9
Computer Operators	33.1
Tellers	29.6

If the educational community is going to respond to the major changes that computers have made in the office, training programs in business education in vocational schools and comprehensive high schools must be realistic and up-to-date.

PART II

PROCEDURES AND METHODOLOGY

This project as indicated in Part I, will present recommendations concerning state-of-the art computer laboratories, software and teacher training needed to better prepare students for employment in Information Processing occupations. More specifically, the objectives are as follows:

1. To determine the types of computer hardware and software currently used by Delaware businesses that employ workers from the following five clusters of office occupations.

    a. accounting, bookkeeping and related jobs
    b. banking and related financial jobs
    c. business data processing related jobs
    d. secretarial and related jobs
    e. typing, general office and related jobs

2. To identify generic and specific computer related job skills needed for entry-level employment in the five clusters.

3. To determine the types and number of computers located in business departments of comprehensive and area vocational schools.

4. To determine the degree computer applications are presently being implemented in business courses.

Two questionnaires were developed to address these objectives. Prior to mailing the questionnaires, a Review Committee, under the direction of Dr. Chester Freed, Research and Evaluation, State Department of Public Instruction, critiqued the questionnaire to assure that items would illicit responses consistent with the objectives selected for the study.

The sample populations selected for the study included all area vocational-technical schools and comprehensive high schools (31) and business firms - 1426 office workers representing the following economic sectors:

a. transportation, communications, and utilities
b. finance, insurance and real estate
c. service and miscellaneous
d. wholesale, retail trade
e. government

Eight businesses were randomly selected from categories "a-g" representing New Castle, Kent and Sussex counties. One survey was used for category "e".

Questionnaires were mailed to Personnel Directors, Human Resource Specialists, Managers and owners of businesses. Questionnaires prepared for schools were mailed to Superintendents. The return rate for business was 90%. The return rate for schools was 100%.

PART III

FINDINGS

The primary purpose of this project was to collect data to support recommendations concerning state-of-the-art computer laboratories, software and teacher training that will better prepare students for employment in Information Processing Occupations.

Accordingly, this project attempted to answer the following research questions. The findings are presented with each research question.

Ia. What types of computers are presently being used by business and industry? (Appendix E)

TABLE I

Hardware	% of Hardware users
IBM PC/Compatibles	82%
Macintosh	30%
Mini/Mainframes	42%

Ib. What types of software packages are currently being used by business and industry? (Appendix F)

TABLE II

Software	% of Software users
WordPerfect	78%
WordStar	38%
Lotus	71%
Displaywrite	38%
dBase III+	12%

2. What generic and specific computer related job skills are needed for entry-level employment in the five clusters? (Appendix G)

TABLE III

	% of firms using software applications	% of firms requiring pre-employment skills in software application
Word Processing	91%	69%
Spreadsheet	81%	63%
dBase Management	48%	18%
Accounting	44%	35%
Desktop Publishing	9%	37%

3. What model and number of computers are located in Business Departments?

TABLE IV
IBM/IBM COMPATIBLE COMPUTERS LOCATED IN
BUSINESS DEPARTMENTS

Number of Computers:	Schools 0-5	6-14	15-over
	Cape Henlopen	Middletown	Brandywine
	Delmar	Milford	Caesar Rodney
	John Dickinson	Sussex Vo-Tech	Christiana
	Dover		Claymont
	Alexis I. duPont		Concord
	Indian River		Delcastle
	Laurel		Glasgow
	McKean		Hodgson Vo-Tech
	Seaford		Howard
	Sussex Central		Kent Vo-Tech
	Wilmington		Kent North
	Woodbridge		Lake Forest
			Newark
			Smyrna
			William Penn

TABLE V
APPLE COMPUTERS LOCATED IN
BUSINESS DEPARTMENTS

Number of Computers:	Schools 0-5	6-14	15-over
	Brandywine	Caesar Rodney	John Dickinson
	Christiana	Cape Henlopen	A. I. duPont
	Claymont	McKean	Laurel
	Concord	Middletown	Sussex Vo-Tech
	Delmar	Milford	
	Dover	Wilmington	
	Glasgow		
	Hodgson		
	Indian River		
	Newark		
	Seaford		
	Smyrna		
	Sussex Central		
	William Penn		
	Woodbridge		

TABLE VI

IBM PC AND COMPATIBLES

COMPUTER APPLICATIONS IN BUSINESS COURSES

Number of Schools Surveyed - 31

4. What computer applications are currently being implemented in business courses? (Table VI, IBM PC/Compatibles; Table VII, Apple), Appendices H & I

Courses	% of Schools implementing computer applications*
Accounting	22.6%
Cooperative Office Education	6.5%
General Office Procedures	22.6%
Keyboarding/Typing	3.2%
Office Machines	6.5%
Intensive Office Education	3.2%
Shorthand	9.7%
Word Processing	41.9%

*Percentages include schools with five or less computers

TABLE VII
APPLE COMPUTER APPLICATIONS
IN
BUSINESS COURSES

Number of Schools Surveyed - 31

Courses	% of Schools implementing computer applications*
Accounting	25.8%
Cooperative Office Education	6.5%
General Office Procedures	22.5%
Keyboarding/Typewriting	6.5%
Office Machines	9.7%
Intensive Office Education	16.1%
Shorthand	12.9%
Word Processing	25.8%

*Percentages include schools with five or less computers

PART IV

SUMMARY

Based on the information presented in Part III, recommendations can be made relative to improving, updating and expanding Business and Office Education with emphasis on Information Processing.

Hardware and Software

The survey of businesses reveals that students are best prepared for employment in business and government if they have skills using IBMs and compatible hardware along with the following business application software:

1.	Word Processing	WordPerfect and WordStar
2.	Database	dBase III and dBase III+
3.	Spreadsheets	Lotus 1-2-3
4.	Accounting	General familiarity (no particular package)
5.	Desktop Publishing	Pagemaker

Computer Application in Business Courses

Business teachers can better prepare students for employment in Information Processing Occupations if appropriate equipment and training is available.

PART V
RECOMMENDATIONS

Recommendations for Hardware

Based on the findings of this study, the Governors Task Force on Vocational Education, and other studies noted in this report, it is recommended that:

1. The State Department of Public Instruction secure appropriate funds to equip an IBM/IBM Compatible Networked-Micro Computer laboratory for business departments in comprehensive and vocational schools.

   With consideration for student station operating speed and future software compatibility, the following minimum requirements are proposed: (All costs are estimates)

Comprehensive High Schools
Student Workstations
Minimum Requirements

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
13	IBM/IBM Compatibles Features 80286, 8MHz Clock Speed 640 K RAM EGA/VGA Monitor & Adapter Network Adapter/Interface Board 101 Keyboard/Enhanced Printer Port Serial Port MS-DOS 3.3 Support	18	$1,800.00	$421,200.00
25	Macintosh (Desktop Publishing)	2	$5,000.00	$250,000.00

Vocational Schools
Student Workstations
Minimum Requirements

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
8	IBM/IBM Compatibles Features 80286, 8MHz Clock Speed 640 K RAM EGA/VGA Monitor & Adapter Network Adapter/Interface Board 101 Keyboard/Enhanced Printer Port Serial Port MS-DOS 3.3 Support	18	$1,800.00	$194,400.00
6	Macintosh (Desktop Publishing)	2	$5,000.00	$60,000.00
3	A-S/400 Processor and (9404) - P20) - 8 MB of memory - 945 MB of disk - tape cartridge backup - diskette unit	1	$67,210.70	$201,630.00

Comprehensive High Schools
Teacher Workstations
Minimum Requirements

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
25	Teacher Workstations	1	$2,400.00	$60,000.00
25	Kodak Data show type - projection device with appropriate interfaces	1	$800.00	$20,000.00
25	Printer - Dot Matrix, 240 CPS	1	$1,500.00	$37,500.00
25	Printer - LaserWriter	1	$3,500.00	$87,500.00

Vocational Schools
Teacher Workstations
Minimum Requirements

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
10	Teacher Workstations	1	$2,400.00	$24,000.00
10	Kodak Data show type - projection device with appropriate interfaces	1	$800.00	$8,000.00
10	Printer - Dot Matrix, 240 CPS	1	$1,500.00	$15,000.00
10	Printer - LaserWriter	1	$3,500.00	$35,000.00

Comprehensive High Schools
Network File Server Configuration
Minimum Requirements

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
25	Network File Server and upgrade for 19 schools	1	$10,000.00	$250,000.00 $31,785.00 $281,785.00

Features

- Minimum 150 Meg Hard Drive, Tape Backup - with ability to complete System Backup during full network operation
- Printer Ports - 2 minimum w/Post Script Support
- Cache RAM 1 Meg
- 80386 Processor
- Macintosh Interface/ Appletalk
- MS-DOS/OS2 Compatibility
- Mainframe Bridge compatibility support for 15-25 simultaneous users
- Network Interconnectivity
- Battery Backup System

Vocational Schools
Network File Server Configuration
Minimum Requirements

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
6	Network File Server and upgrade for 19 schools	1	$10,000.00	$60,000.00 $31,785.00 $91,785.00

Features

- Minimum 150 Meg Hard Drive, Tape Backup - with ability to complete System Backup during full network operation
- Printer Ports - 2 minimum w/Post Script Support
- Cache RAM 1 Meg
- 80386 Processor
- Macintosh Interface/ Appletalk
- MS-DOS/OS2 Compatibility
- Mainframe Bridge compatibility support for 15-25 simultaneous users
- Network Interconnectivity
- Battery Backup System

Recommendations for Software

2. Based on job growth information showing substantial increases in positions requiring business computer applications (Delaware Department of Labor) and the findings of this project, it is recommended that the current LAN (Local Area Network) version of business application software of the following software packages be provided for vocational and comprehensive high schools:

Comprehensive High Schools Application Software

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
25	Application Software - WordPerfect - Lotus 1-2-3 - dBase - Pagemaker - MS-DOS* - OS/2 - Microsoft Word - Southwestern Accounting - MacDraw - Schoolmate	1	$5,500.00	$137,500.00

*Included in all IBM/Compatibles

Vocational Schools
Application Software

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
6	Application Software - WordPerfect - Lotus 1-2-3 - dBase - Pagemaker - MS-DOS* - OS/2 - Microsoft Word - Southwestern Accounting - MacDraw - Schoolmate	1	$5,500.00	$33,000.00

*Included in all IBM/Compatibles

Recommendations for Teacher Training

3. The Business Teachers Task Force has indicated a need for certification and training in Information Processing. It is recommended that the State Department of Public Instruction provide certification requirements and partial tuition incentives for training teachers in Information Processing. It is further recommended that all business teachers be allowed five years to meet certification requirements.

Teacher Training

No. of Labs (Schools)	Item	Quantity (Per School)	Unit Cost	Total Cost
300	Teacher Training	All	$100.00	$30,000.00

PART VI

PROGRAM IMPLICATIONS

1. Business Education classes will reflect state-of-the-art technology and produce a more qualified work force.

2. The curriculum will emulate business work force patterns and electronic system procedures; and keep students on the cutting edge with business and industry.

3. The laboratory will provide an environment to enhance basic skills in communication, time management, decision making, and critical thinking.

4. The laboratory will provide an environment for students to develop desirable work ethics and refine personal skills such as integrity, trust, dependability and responsibility.

5. The laboratory will allow for a better coordinated curriculum between math and English course competencies.

6. The network can serve as the vehicle to connect high school and community college programs for competency articulation.

7. The laboratory can provide a more individually prescribed curriculum for Special Needs students, i.e., hardware and software are available with sound and speech features.

IMPLICATIONS AND RECOMMENDATIONS FOR UPDATING, EXPANDING AND IMPROVING BUSINESS EDUCATION

PROJECTED BUDGET SUMMARY COMPREHENSIVE HIGH SCHOOLS

1.	IBM PC/Compatibles	$421,200.00
2.	Macintosh	$250,000.00
3.	Teacher Work Station	$60,000.00
4.	Data Show	$20,000.00
5.	Printers	
	Dot Matrix	$37,500.00
	LaserWriter	$87,500.00
6.	Network Configuration and upgrade for 19 schools	$281,785.00
7.	LAN Software Packages	$137,500.00
8.	Teacher Training	$30,000.00
9.	Furniture	$80,000.00
	TOTAL	$1,405,485.00

These prices exceed the usual school discount and are available only for large orders.

IMPLICATIONS AND RECOMMENDATIONS FOR UPDATING, EXPANDING AND IMPROVING BUSINESS EDUCATION

PROJECTED BUDGET SUMMARY VOCATIONAL SCHOOLS

1.	IBM PC/Compatibles	$194,400.00
2.	Mainframes	$201,630.00
3.	Macintosh	$60,000.00
4.	Teacher Workstations	$24,000.00
5.	Data Show	$8,000.00
6.	Printers	
	Dot Matrix	$15,000.00
	LaserWriter	$35,000.00
7.	Network Configuration and upgrade	$91,785.00
8.	LAN Software Packages	$33,000.00
9.	Teacher Training	$30,000.00
10.	Furniture	$80,000.00
	TOTAL	$772,815.00

These prices exceed the usual school discount and are available only for large orders.

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APPENDIX A

May 23, 1988

Dear (Employer):

The economic growth in Delaware during the past eight years has had a profound impact on Business and Office Education programs in our high schools. Every recent prediction of future opportunities for office workers includes statistics showing an increased need for workers in the "information era."

To address these projections, The State Department of Public Instruction, Vocational Division is conducting a survey to determine the type of office equipment and software packages used for the occupations listed on the survey.

Responses to items on the attached survey will provide data needed to:

1) Determine training and equipment needed in Business and Office Education Programs throughout the State to address employment trends.

2) Better train students for entry level employment in information processing occupations.

3) Implement state-of-the-art Information Processing Laboratories in high school business education departments throughout the State.

Updating and expanding Business Education Programs in the State of Delaware is a priority of the Department of Public Instruction. We need your assistance in this effort so that we can address the employment needs for entry level employees by providing school districts in Delaware with state-of-the-art business office equipment for training purposes.

Please complete the attached form and return to:

Sarah L. Bell, State Supervisor
Business & Office Education
Department of Public Instruction
P. O. Box 1402
Dover, Delaware 19903

Thank you for your help in this effort. If you have any questions regarding this survey, please contact me at 736-4681.

Sincerely yours,

Sarah L. Bell, State Supervisor
Business and Office Occupations

SLB:sj

Attachment

APPENDIX B

May 23, 1988

Dear (Superintendent):

The economic growth in Delaware during the past eight years has had a profound impact on Business and Office Education programs. Every recent prediction of future opportunities for office workers includes statistics showing an increased need for workers in the "information era."

To address these projections, The State Department of Public Instruction, Vocational Division is conducting an equipment inventory survey to determine the availability of office equipment and software packages used for training in the occupations listed on the survey.

Responses to items on the attached survey will provide data needed to:

1) Determine training and equipment needed in Business and Office Education Programs throughout the State to address employment trends.

2) Better train students for entry level employment in information processing occupations.

3) Prepare recommendations for the State Board of Education to fund state-of-the-art Information Processing Laboratories, curriculum development, and teacher training for all Business Departments in Delaware.

Updating and expanding Business Education Programs in the State of Delaware is a priority of the Vocational Division, Department of Public Instruction. We need your assistance in this effort so that we can address the employment needs for entry level employees by providing school districts in Delaware with state-of-the-art business office equipment for training purposes.

Please have an appropriate person complete the attached survey and return by June 17, 1988 to:

Sarah L. Bell, State Supervisor
Business & Office Education
Department of Public Instruction
P. O. Box 1402
Dover, Delaware 19903

Thank you for your help in this effort.

Sincerely yours,

Mr. Sidney B. Collison, Asst. Superintendent
Instructional Services Branch

Dr. Thomas M. Welch, Director
Vocational Division

SBC:TMW:sj

Attachment

APPENDIX C

STEERING COMMITTEE
PROGRAM AND EQUIPMENT ASSESSMENT

BUSINESS & OFFICE EDUCATION
DEPARTMENT OF PUBLIC INSTRUCTION
VOCATIONAL EDUCATION DIVISION

AUGUST 16, 1988

8:30 - 8:45 a.m.	-	Greetings & Overview of Project Dr. Thomas M. Welch, State Director Vocational Education Division
8:45 - 9:15 a.m.	-	Results of Program and Equipment Surveys Sarah L. Bell, State Supervisor Business and Office Education
9:15 - 9:45 a.m.	-	Implications and Recommendations

Equipment Review

10:00 a.m.	-	International Business Machines IBM - Christine Olsen
10:30 a.m.	-	Tandy Corporation Kerwin Boyer
11:00 a.m.	-	Delaware Business Systems Michael Hynson
11:20 a.m.	-	Dean Williams
11:30 - 12:00 p.m.	-	Proposal Review & Rating

SLB:sj
8/15/88

APPENDIX D

AGENDA

AD HOC COMMITTEE
PROGRAM & EQUIPMENT ASSESSMENT
BUSINESS & OFFICE EDUCATION

SHERATON INN-DOVER
AUGUST 18, 1988

10:00 - 10:15 A.M.	-	Greetings & Overview - Sarah L. Bell
10:15 - 10:45 A.M.	-	Results of Program & Equipment Surveys - Sarah L. Bell
10:45 - 11:00 A.M.	-	Refreshment Break
11:00 - 12:45 P.M.	-	Lunch/Committee Meetings A. Implications and recommendations for Professional Development/Teacher Training/Certification in Information Processing B. Implications and recommendations for expanding and updating Business and Office Education Programs C. Implications and Recommendations for Computer Hardware, Software and Networking
1:00 - 1:45 P.M.	-	Committee Reports and Group Interaction
1:45 P.M.	-	Adjournment

SLB:sj
8/15/88

TABLE I

COMPUTER HARDWARE USED BY DELAWARE BUSINESSES

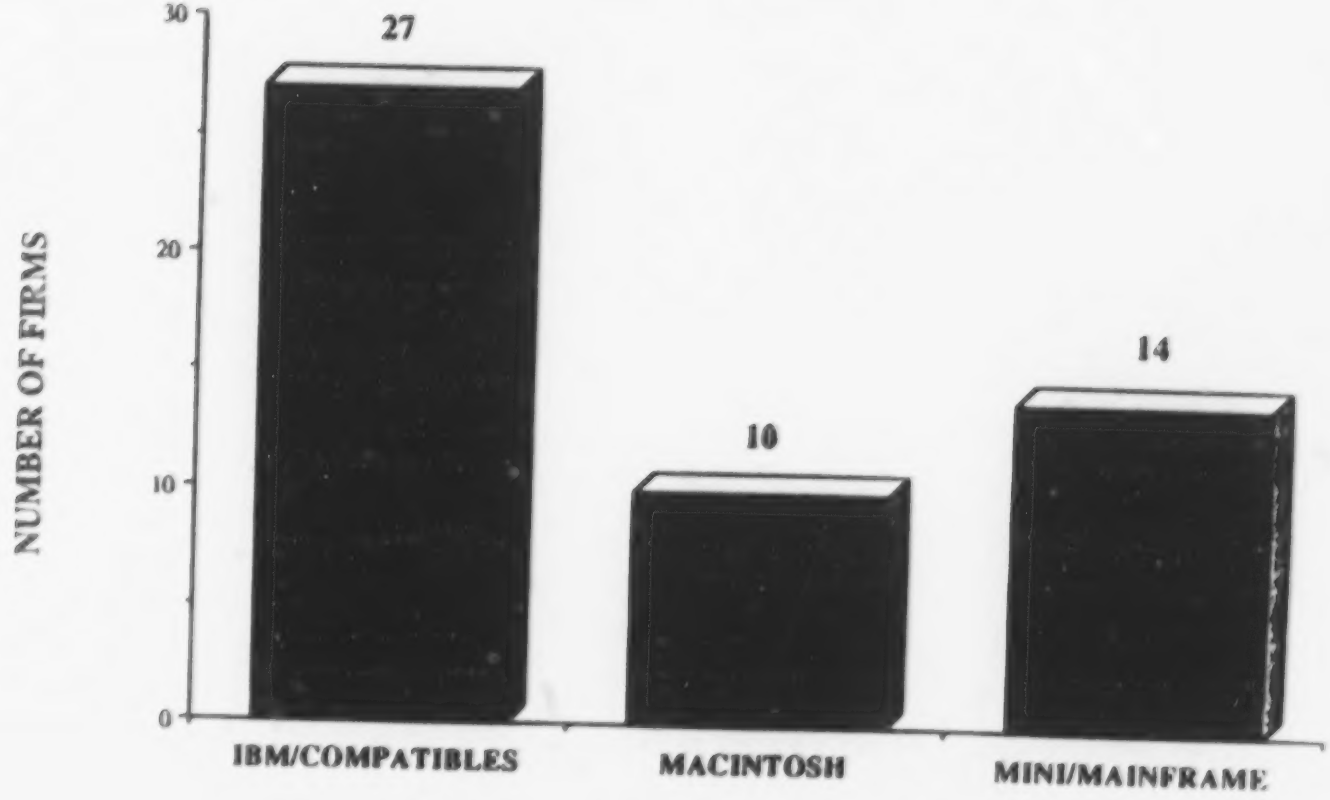
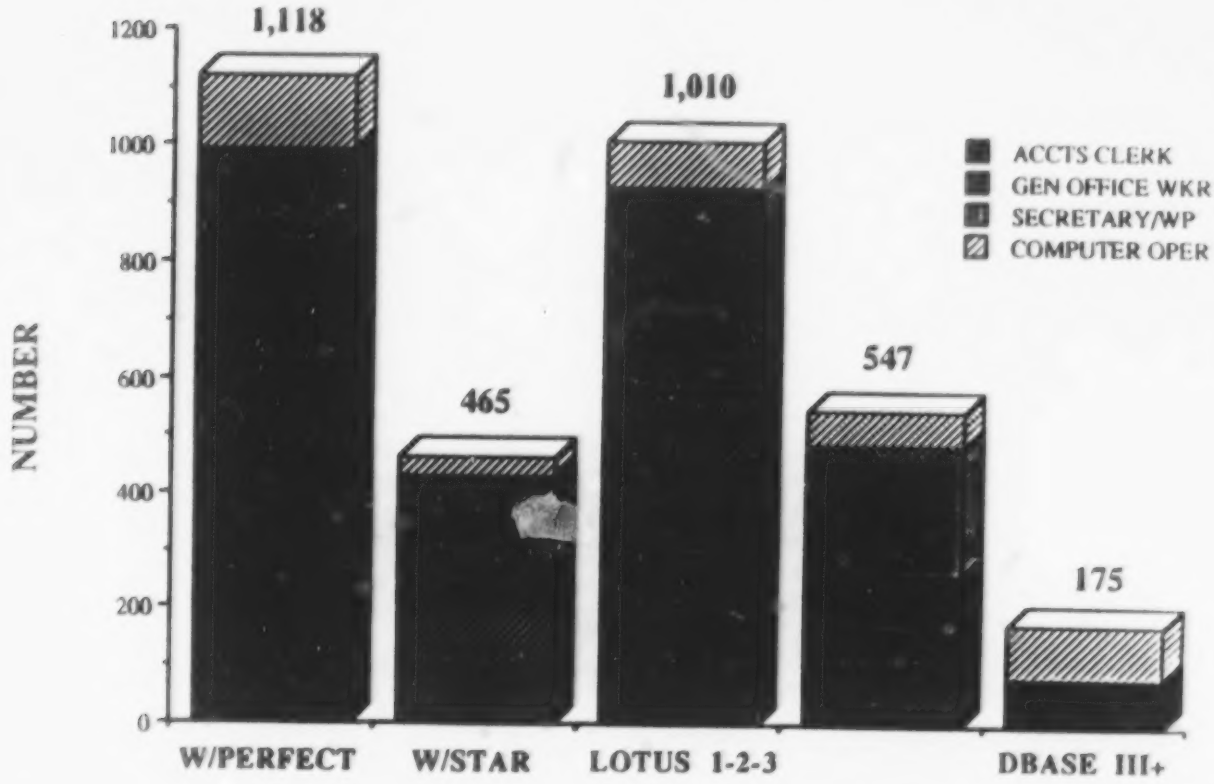


TABLE II

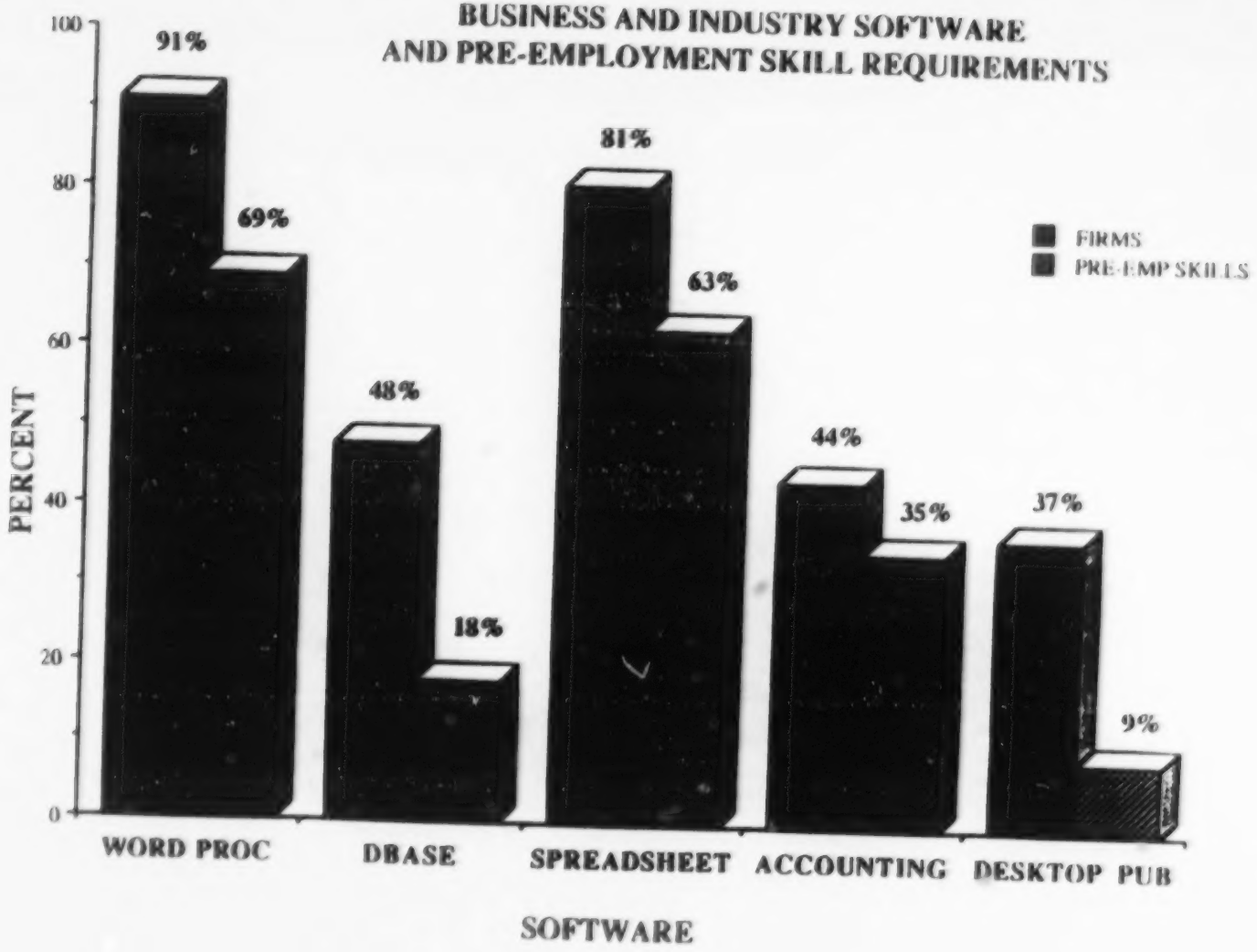
APPLICATION SOFTWARE USED IN BUSINESS AND INDUSTRY



APPENDIX F

TABLE III

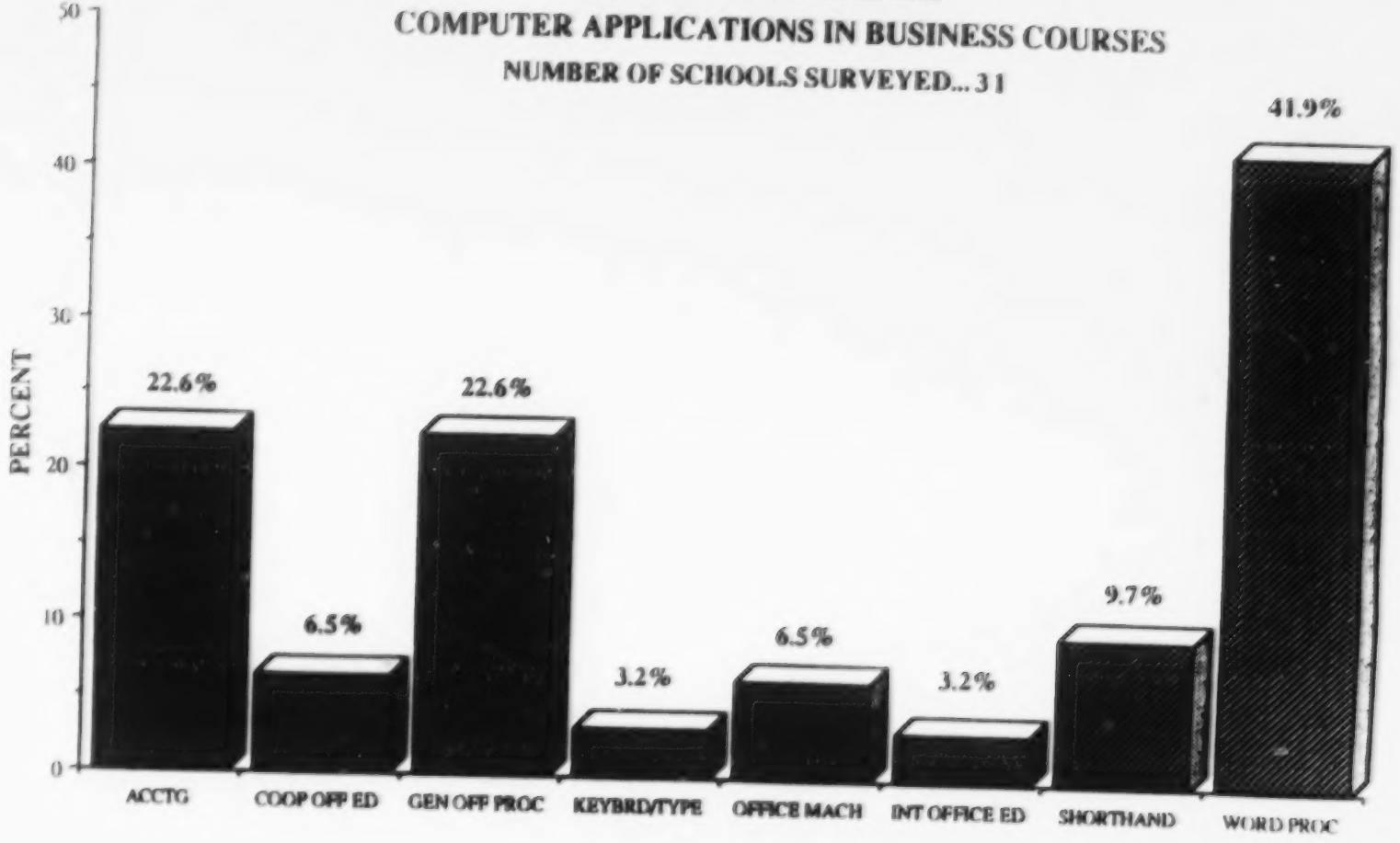
BUSINESS AND INDUSTRY SOFTWARE AND PRE-EMPLOYMENT SKILL REQUIREMENTS



APPENDIX G

TABLE VI

IBM AND COMPATIBLES
COMPUTER APPLICATIONS IN BUSINESS COURSES
NUMBER OF SCHOOLS SURVEYED... 31

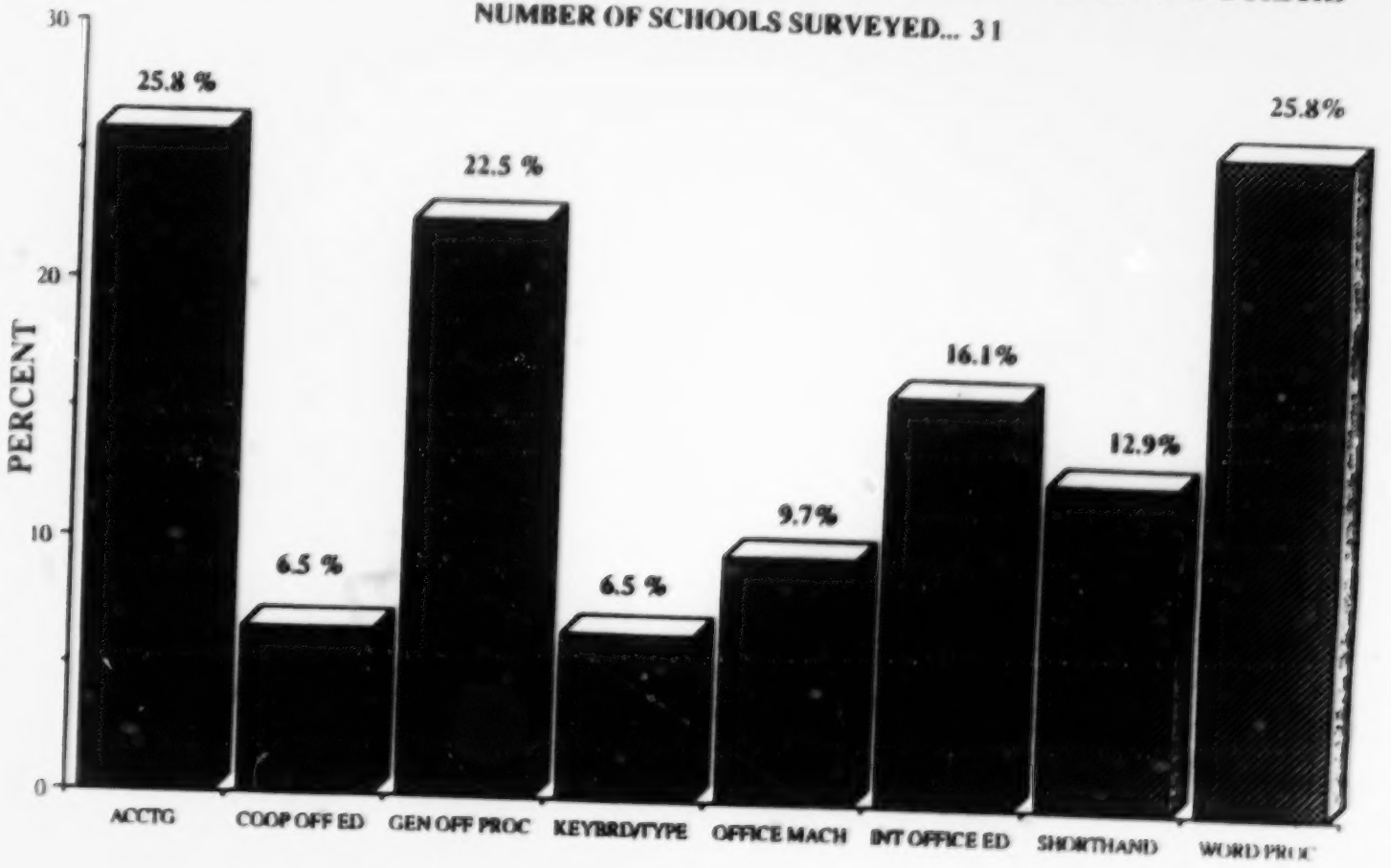


APPENDIX H

TABLE V

APPLE COMPUTER APPLICATIONS IN BUSINESS COURSES

NUMBER OF SCHOOLS SURVEYED... 31



BUSINESS COURSES

APPENDIX I

APPENDIX J

PROPOSED CURRICULUM SEQUENCE FOR VOCATIONAL SCHOOLS

Information Systems and Services
Data Entry Operator

Cip Code	Course	Length of Course
Tenth		
07.0307	Computers and Information Technology	1 semester
07.0308	Introduction to Business Computer Applications	1 semester
07.0309	Business Computer Applications Software I	1 year
07.0710	Micro Computer Keyboarding and Keypad Operations	1 semester
	Applied Technical Communications	1 year
	Applied Technical Math	1 year
Eleventh		
07.0303	Data Entry Principles, Control and Operations	1 year double periods
07.0310	Program Design & Development	
07.0311	Computer Information Systems & Programs	1 semester
07.0314	Operating Systems and Networking	1 year
07.0351	Financial Information Processing I	1 year
07.0401	Office Supervision & Management	1 semester
Twelfth		
07.0303	Data Entry Principles, Control and Operations	1 year
07.0359 07.0402	Employment Seminar/ Business Enterprise	1 year
07.0599	Cooperative Office Experience	1 year

APPENDIX K

PROPOSED CURRICULUM SEQUENCE FOR VOCATIONAL SCHOOLS

Information Systems and Services
Data Assistant

Cip Code	Course	Length of Course
Tenth		
07.0307	Computers and Information Technology	1 semester
07.0308	Introduction to Business Computer Applications	1 semester
07.0309	Business Computer Applications Software I	1 year
07.0710	Micro Computer Keyboarding and Keypad Operations	1 semester
	Applied Technical Communications	1 year
	Applied Technical Math	1 year
Eleventh		
07.0310 07.0311 07.0314	Program Design & Development Computer Information Systems & Programs Operating Systems & Networking	1 year double periods
07.0351	Financial Information Processing I	1 year
07.0401	Office Supervision & Management	1 semester
Twelfth		
07.0311	Computer Information Systems and Programs	1 year
07.0359 07.0402	Employment Seminar/ Business Enterprise	1 year
07.0599	Cooperative Office Experience	1 year

APPENDIX L

PROPOSED CURRICULUM SEQUENCE FOR VOCATIONAL SCHOOLS

Information Systems and Services
Word Processing Operator

Cip Code	Course	Length of Course
Tenth		
07.0307	Computers and Information Technology	1 semester
07.0308	Introduction to Business Computer Applications	1 semester
07.0309	Business Computer Applications Software I	1 year
07.0710	Micro Computer Keyboarding and Keypad Operations	1 semester
07.0351	Financial Information Processing I	1 year
	Applied Technical Communications	1 year
	Applied Technical Math	1 year
Eleventh		
07.0310 07.0314	Program Design & Development Operating Systems and Networking	1 year double periods
07.0401	Office Supervision & Management	1 semester
07.0710	Information Processing I	1 year
Twelfth		
07.0359 07.0402	Employment Seminar/ Business Enterprise	1 year
07.0599 07.0802	Cooperative Office Experience/ Word Processing Operator Applications	1 year

APPENDIX M

PROPOSED CURRICULUM SEQUENCE FOR VOCATIONAL SCHOOLS

Information Systems and Services
Computer Operator

Cip Code	Course	Length of Course
Tenth		
07.0308	Introduction to Business Computer Applications	1 semester
07.0309	Business Computer Application Software I	1 year
07.0710	Micro Computer Keyboarding and Keypad Operations	1 semester
07.0351	Financial Information Processing I	1 year
	Applied Technical Communications	1 year
	Applied Technical Math	1 year
Eleventh		
07.0302 07.0304	Computer Operations and Services/ Job Control Language	1 year double periods
07.0303	Data Entry Principles, Controls and Operations	1 semester
07.0310	Program Design and Development	1 year
07.0314	Operating System & Networking	1 year
Twelfth		
07.0302 07.0304	Computer Operations and Services/ Job Control Language (Applications)	1 year double periods
07.0359 07.0402	Employment Seminar/ Business Enterprise	1 year
07.0599	Cooperative Office Experience	1 year

APPENDIX N

PROPOSED CURRICULUM SEQUENCE FOR VOCATIONAL SCHOOLS

Information Systems and Services
Computer Programmer (Entry Level)

Cip Code	Course	Length of Course
Tenth		
07.0307	Computers and Information Technology	1 semester
07.0308	Introduction to Business Computer Applications	1 year
07.0309	Business Computer Application Software I	1 year
07.0710	Micro Computer Keyboarding and Keypad Operations	1 semester
	Applied Technical Communications	1 year
	Applied Technical Math	1 year
Eleventh		
07.0305	Business Data Programming I Advanced BASIC, JCL & COBOL	1 year double periods
07.0310	Program Design & Development	1 year
07.0311	Computer Information Systems & Programs	1 year double periods
07.0314	Operating Systems and Networking	1 year
07.0351	Financial Information Processing I	1 year
07.0401	Office Supervision & Management	1 semester
Twelfth		
07.0305	Business Data Programming Applications	1 year
07.0359 07.0402	Employment Seminar/ Business Enterprise	1 year
07.0599	Cooperative Office Experience	1 year

APPENDIX O

PROPOSED CURRICULUM SEQUENCE FOR VOCATIONAL SCHOOLS

Information Systems and Services
Banking and Related Financial Programs

Cip Code	Course	Length of Course
Tenth		
07.0307	Computers and Information Technology	1 semester
07.0308	Introduction to Business Computer Applications	1 semester
07.0309	Business Computer Applications Software I	1 year
07.0710	Micro Computer Keyboarding and Keypad Operations	1 semester
07.0351	Financial Information Processing I	1 year
	Applied Technical Communications	1 year
	Applied Technical Math	1 year
Eleventh		
07.0309	Business Computer Applications Software II	1 year
07.0310	Program Design & Development	1 year
07.0311	Computer Information Systems & Programs	
07.0314	Operating Systems and Networking	1 year
07.0401	Office Supervision & Management	1 semester
Twelfth		
07.0352	Banking Applications	1 year
07.0359 07.0402	Employment Seminar/ Business Enterprise	1 year
07.0599	Cooperative Office Experience	1 year